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ABSTRACT

Reviewing health related "costs" of female labor force participation, this paper examines four highly salient maternal and child health issues. Discussion of acute illness in day care settings begins with an overview of studies on day care and illness and focuses on hepatitis A, appropriate sanitation, and indications of research on respiratory conditions. Policy recommendations for implementation at state, community, and center levels are offered. Subsequent discussion describes ways a woman's entry into the labor force can affect her family's nutrition and recommends that nutritional supports should be available to women working at home or in the labor force. Discussion of health insurance for mothers focuses on national and South Atlantic regional data indicating type of health insurance coverage for and number of plans held by mothers of varying marital and employment status. Recommendations illustrate two different approaches to providing better health insurance for mothers. Further discussion, concerning occupational health and the female labor force, begins with an overview and specifies two major issues confronting North Carolina policymakers. Recommendations considered proactive and maximally protective are offered. Additional analysis and discussion focuses on the protection of the working woman against occupational assaults on her health, reproductive system, and fetus. To select a policy that effectively addresses this problem, the concluding discussion rates five policy options across nine criteria. Examples of hazardous conditions in 13 predominantly female jobs are provided. (RH)

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Maternal and Child Health Issues and Female Labor Force Participation

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Maternal and Child Health
Issues and Female Labor Force Participation

Introduction

Until recently, female participation in the labor force had been cyclical, increasing with each surge in the demand for workers and abating with a decline in overall economic conditions of the country. One of the most striking and significant characteristics of today's labor force picture is the consistent increase in the participation rates for women. In fact, the number of women in the labor force has more than doubled in the past 30 years--from 18 million women in 1950 to 44.6 million in 1980 when women accounted for more than two-fifths of all workers (U.S. Department of Labor, 1980). For most of these women, working outside of the home is not a matter of choice. Now more than ever, single and married women are entering the labor force because of economic necessity.

This fact is especially relevant for single mothers (unmarried, separated, divorced, or widowed) who are their family's sole source of financial support. An increasing number of these women are forced to find a way to supplement family income because of inadequate monetary assistance from government, absence of child support payments, or the curtailment of government-funded child care and health programs. The number of these single headed households has almost doubled in the past 20 years--from 4.5 million in 1960 to 8.5 million in 1979. Nor are female-headed families a fixed and stable demographic group. Rather, it has undergone some important changes in the past 30 years. First, the presence of children has increased: 45% of these families had children under 18 in 1979 (U.S. Department of Labor, 1980). Second, although the number of female-headed families has been increasing across all income groups in the population, most of these families have incomes that render them poor or near poor. In 1977, the average income for female-headed households was less than one-half that for male-headed households, and 41% of families headed by women with husbands absent were below the poverty level (U.S. Bureau of the Census, 1980). This rate was much higher than the rates of poverty among husband-wife families (5.4%) or families with a male single parent (9.2%, U.S. Bureau of Census, 1980).

The acuteness of this problem is reflected in a 1980 report by the National Advisory Council on Economic Opportunity. In that report, the Council noted that "the feminization of poverty has become the most compelling social fact of the decade" (p. 147). Further, it noted that by the year 2000 the poverty population will be composed almost solely of women and their children.

The striking number of female heads-of-household living in poverty, however, should not be construed to mean that married females do not find themselves in a similar predicament. In fact, there is evidence to suggest that these women also need to work because their income often makes the difference between deprivation and an adequate level of living. What is characteristic of the increase in female labor force participation is that more poor women are in paid employment than before, more females in the labor force are married, and more of them are single mothers and heads of households. Concomitantly, the majority of these women are in low paying jobs that have limited opportunities, are performing jobs in unsafe environments, and have inadequate health and child care benefits.

North Carolina has had a particularly high rate of female employment for many years. In fact, the State has one of the highest female labor force participation rates in the country. Women now represent 43% of the national workforce, but 55% of the workforce in North Carolina. However, the State's experience parallels that of the nation; i.e., most working women are in low paying jobs such as clerical, service, sales and unskilled factory work (North Carolina Department of Natural Resources and Community Development, 1983).

Like the rest of the nation, significant changes are also occurring in the makeup of North Carolina households. One significant change is the number of single-parent households (about 90% of which are headed by women) and nonfamily households (persons living alone or with unrelated individuals). It is estimated that by the year 2000, these households in North Carolina will increase by 50% compared to 1980. The significance of this change is that such households, nearly a third of which contain children, are approximately twice as likely to be living in poverty as other households.

A review of the labor force participation of households below the poverty line reveals that at least one member is either working or is able to work. In fact, 6 out of 10 of these poor households contain someone who can work. However, studies also show that even though half the households have someone who is employed either full or part-time, they do not earn enough to stay out of poverty. Single females especially face problems because they hold jobs traditionally held by women--low wage jobs with inadequate benefits. These women also face the added barrier of inadequate child care.

While these problems affect all women, they are more damaging to single female heads of households since these women are often the sole source of support for their families. Furthermore, female-headed families have been adversely affected by the reductions in federally funded programs such as AFDC, food stamps, child nutrition, school lunch, and Medicaid.

The scenario created by this review suggests that women are being forced to participate in the labor force due to economic necessity, but there exist some factors that make their participation in the labor force less attractive than unemployment. That is, while women are increasingly having to seek employment outside the home because of economic necessity, paradoxically, once these women enter the labor force, there is no guarantee that their economic well-being and that of their families is improved since the "costs" of their work often outweigh the benefits. In fact, many of these women secure low-paying positions which are located in unsafe environments, have limited opportunities for advancement, and have inadequate health and child care benefits, thus making participation in the labor force unattractive. These circumstances raise concerns about the efficacy of female participation in the labor force.

This paper will review some of the health related "costs" of female work. More specifically, we examine sick child care, child nutrition, occupational safety, and health insurance benefits. In selecting these issues for study, we are not denying the existence of other important issues that might act as disincentives to female labor force participation. Some of these factors, such as inequity in social security and pension benefits, have received considerable attention in the health policy literature. We believe the issues selected for

this paper, however, to be the four most salient maternal and child health issues that have received inadequate attention in the literature addressing barriers to or "costs" of female labor force participation. In the final section of the paper, we will analyze occupational safety in detail, with particular reference to needed policies.

Day Care and Acute Illness

Overview of Studies on Daycare and Illness

The provision of day care services to children in North Carolina is highly fragmented. Who is serving these children is a matter of educated speculation. Day care centers generally come to the attention of the State when they seek licensing so that the families of the children they serve may seek reimbursement from public funds. Since the great majority of children receiving day care are served by providers who keep only one or two children, through private contractual arrangements between providers and parents, such arrangements are often invisible to state government. Best estimates, however, are that 10% of children are served in day care centers; 30-40% are served in what are called "family homes"; and the remainder are kept by family members or immediate relatives (Haskins, 1979).

There are a number of contagious illnesses of varying degrees of severity which pose a particular public health problem to children in day care centers. They fall into two broad clusters, and may be categorized by the systems they infect: the respiratory system and the enteric system. Examples of the former include the common cold, croup, pneumonia, and otitis media (earaches). Examples of the latter include hepatitis and diarrhea due to viruses, bacteria (particularly shigellosis), and protozoans, especially giardia lamblia. All of these gastrointestinal diseases are spread through oral-fecal contamination. However, they vary significantly in both their symptoms and in their contagiousness.

Research is just beginning to address the problem of contagious illnesses in day care centers, and the related issues of how and where to care for a sick child. At this point not enough is known to present with any accuracy the incidence and prevalence of contagious illnesses in North Carolina, or even in this country as a whole. However, preliminary findings do challenge some current health practices in day care centers, and suggest the need to change current protocols which are either failing adequately to protect the children and their families, or are suggesting unnecessarily that sick children be removed from day care centers.

The contagious illness which has received the greatest attention in the literature is hepatitis A. It has been labelled "a major potential problem in public health" (Hadler, Webster, Erben, Swanson, & Maynard, 1980), and about 75% of cases associated with day care centers can be traced to in children under the age of 3. Further, these children are often themselves asymptomatic but act as vectors, transmitting the disease to those adults with whom they come in contact. While North Carolina has been spared any identified outbreak of substantial size, it is included among the sunbelt states whose children have been identified as most susceptible (Hadler, Erben, Francis, Webster, & Maynard, 1982). Hepatitis is spread through inadequate sanitary practices of

day care staff, especially those responsible for children who are not toilet trained (generally, children under the age of 3). These practices include the staff's failure to wash their hands after changing diapers and before cooking meals. Outbreaks of hepatitis can be reduced by protecting those exposed with immunoglobin.

Other enteric diseases such as giardia and shigellosis manifest themselves clinically in children with diarrhea, sometimes febrile in nature (Weissman, Schmenler, Weiler, Filice, Godbey, & Hansen, 1974). Further complicating the public health picture, children who have recovered from shigellosis continue to excrete the organism for 2 weeks. Once again, appropriate sanitary practices have been shown to reduce the incidence of the diseases by as much as 50% (Black, Dykes, Anderson, Wells, Sinclair, Gary, Hatch, & Gangarosa, 1981).

Indications of Research for Respiratory Conditions

Contagious illnesses of the upper respiratory tract present a different picture, in that improper sanitary practices do not contribute to such an extent in their spread. Further, the symptoms they present are generally not so severe. However, it is a general practice among day care centers to exclude children with febrile conditions. Recent research (Haskins, Herschbiel, Collier, Sanyal, & Finkelstein, 1981) suggests that such isolation may be unnecessary, at least from the perspective of the child removed from school. Children with afebrile illnesses, they found, continue to benefit from instruction and normal social interaction. Children with febrile illnesses were less physically active and cried more, but elicited more social responses from their teachers, particularly when their teachers recognized they were sick. The findings of this research imply that children with minor afebrile and febrile illnesses of a respiratory nature can continue to be adequately served in a day care center.

To care for such children and reduce the risk of infection, parents are often required to take off work or older siblings to stay home from school, sometimes for extended periods. While it is arguable that the child may find such individualized attention (if offered) beneficial, such absenteeism is costly: to the sibling in lost schooling, to the parent in lost wages, and to the employer in lost productivity. At present, there are very few facilities designed to care for the sick child and thereby permit the working families' routine to remain undisrupted.

In the past, the needs of sick children in day care have been met by several largely uncoordinated policies. Local health departments have been involved in sporadic efforts to prevent the spread of disease in day care centers, but these efforts have usually been limited to attempts to confine the spread of acute epidemics such as hepatitis and measles.

Policy Recommendations

Several policy recommendations can be suggested for implementation at the state level, at the county or community level, and by the individual day care center.

State level. Primary responsibility for establishing policy with regards to the health needs of children in day care centers should be assumed by the

State Division of Health Services, in close consultation with other state agencies, public and private day care providers, and concerned citizens' groups. The authors are of the opinion that existing health standards are generally adequate but almost entirely unenforceable, in a state characterized by a multitude of small and geographically dispersed centers and day care homes, many of which are unlicensed. We are thus of the opinion that compliance with health standards should be a community, as opposed to a state, concern. Nevertheless, the Division of Health Services can and should assume a major consultative role in the development of community guidelines for health practices in day care centers.

The responsibilities assumed by the Division might include the following:

1. The active surveillance of day care centers to identify epidemics of particular risk to the children and staff, and to the children's families;

2. The development and dissemination of health education materials, in relation to both disease prevention and health promotion;

3. The development of minimal standards for day care licensure which ensure that standards of sanitation can physically be met, through adequate staff/child ratios and the separation of toileting and food preparation facilities; and

4. The development of a model protocol for health care practices, to be made available as requested to community day care centers.

Community level. We believe any community agency or group which is concerned about health care practices in day care centers should not hesitate to assume a role in the development and implementation of standards. Such groups may include public or private health care providers; day care providers; consumers of day care services; citizens' groups concerned with the quality of services available for children and the local Health Department. However, in the absence of such initiatives, it would appear that the local Health Department would be the logical agency to assume the lead role in the coordination of a local health plan for children in day care.

Such a plan should include the following components:

1. Recommendations limiting the isolation of children with infectious diseases to those whose infections are clearly contagious.

2. The development of guidelines for the involvement of the Health Department and health care providers to meet the disease preventive and health promotion needs of community centers.

3. The development of health education programs for day care children and their families, not only in the area of disease prevention but also health promotion.

4. The identification of neighborhood homes where children sick with noninfectious diseases could be placed during the day.

5. The use of visiting nurses to check on sick children at home during the day, or of volunteers to take care of younger children in their homes. Many community programs already in existence which serve the needs of the homebound elderly could be expanded or adapted to serve sick children.

6. The encouragement of local businesses to offer a "cafeteria" array of benefits, so that workers can tailor a benefit package to meet their needs. Workers with young children may wish to choose a sick leave policy which will allow them to stay home and care for their sick child without having to sacrifice accrued vacation time. Lack of a flexible sick leave policy which accommodates children is a particular problem to workers earning hourly wages, who often have no sick leave benefits whatsoever.

7. The encouragement of the local health care delivery system to provide evening and weekend hours for working parents, and to reinstitute the all but vanished practice of the home visit for families for whom transportation is a problem.

Day care center level. We recognize that since health care practices of individual day care centers cannot be effectively mandated or monitored, even at the local level, compliance with these standards is ultimately voluntary. However, the opportunities for such compliance can be greatly enhanced by careful groundwork at the community level, groundwork which will identify, develop, and offer support services to day care centers in a manner which is perceived as constructive and nonthreatening.

On their part, directors of day care centers should take responsibility for the following:

1. The identification of a staff member, to act as liaison for issues relating to the health department or the individual(s) or agency which has assumed the lead role in developing community health standards for day care centers.

2. The adoption and implementation of policies to prevent the spread of infectious diseases.

A model plan designed to reduce the likelihood of epidemics should address the following issues:

1. Standards of isolation should be developed which are specific by illnesses and age of child.

2. Such standards should suggest what types of childhood illnesses are optimally treated outside of the day care center, either for the well-being of the child or the protection of other children or staff.

3. If isolation is recommended, it should be clearly stated at what stages of the illness and for how long.

4. By the same token, the standards should include a list of those illnesses which are not sufficiently contagious to warrant removal of the child from the center.

5. When infectious diseases have been identified in day care centers, particularly in those serving children under the age of 3, the center:

   a) should accept no new children until the illness has run its course;

   b) should remain open, because of the substantial probability that children presently enrolled have already been exposed, and that these children might then be placed in another, unexposed center (Storch, McFarland, Kelso, Heilman, & Caraway, 1979);

   c) should strongly recommend, in the case of hepatitis A infection, that exposed children and staff receive inoculations of immunoglobulin following one identified case;

   d) Following multiple cases in a short period of time, these inoculations should be recommended for children's families (Hadler et al., 1982).

While none of the above recommendations should present great difficulties in terms of cost, some may prove difficult to implement. Health education materials have already been developed and field tested (Harms, 1982), and are presently available for dissemination. Minimal standards for licensure have largely been written, and responsibility for their implementation rests with the Department of Administration and, for centers seeking subsidized care, with the Department of Human Resources. The coordination of a community health care planning body for day care centers may present greater difficulties, particularly in rural areas. In rural areas the professional resources needed to develop such planning bodies will be much more scarce, and the day care centers and family homes serving children more widely dispersed. Further, in some counties local departments of public health may be reluctant to assume an organizational responsibility for which additional staff resources are not allocated. There is potential, however, for citizen's groups with an interest in the health and welfare of young children to play a significant role.

The implementation of standards for children with infectious illnesses should be highly cost effective, particularly in the prevention of the unnecessary isolation of sick children. Such standards may reduce significantly the time lost to work by parents, and particularly single-parent mothers. Insofar as they inhibit the spread of contagious illnesses among children and parents, all the measures listed above should have a positive effect on the earnings and productivity of the family, and indeed of all those with whom members of the family come into close contact.

Perhaps the most challenging task of the proposed health plan will be providing service to those individuals who keep only two or three children in their home. Such individuals may be understandably reluctant to identify

themselves to the local health planning group for fear that they might be policed and that standards of health practices may be imposed on them which they are either unable or unwilling to meet.

At the present time there are several disincentives for such family homes to register with any public authority or even a local community group whose function was exclusively advisory. Caregivers receiving AFDC may legitimately fear the reduction or loss of their benefits should the Department of Social Services learn of their unreported income. Caregivers may also be concerned about the additional expense for meeting standards required for eligibility for licensure, which they think may either exist at present or be imposed some time in the future. Given that many of these caregivers may live in substandard housing, meeting real or imagined eligibility criteria may be unfeasible, or may require a concomitant rise in day care fees which the parents of children cared for would be unable to afford.

To defuse such resistance to service, these caretakers would have to be persuaded that their identification to the local planning group was in their best interest. One strategy might be to exclude the Department of Administration from participation in the planning group, because of its statutory licensing authority. A second strategy might be to inform such caretakers that with the help of the local planning group they could actively inhibit the spread of diseases into their own families.

Other incentives which could be offered to the caregivers include the following: assurance that these facilities will remain free from licensing requirements; exclusion of income derived from child care from income calculated for AFDC eligibility; and inclusion of the caregiver's name on a list of day care centers which would be disseminated throughout the community.

The planning group can help family day care operators discriminate between sick children for whom they can continue to care from those whom they should send home. Some of the caretakers may also be willing to disseminate health promotion materials to the families of the children for whom they are responsible. A local planning group which was particularly aggressive might offer a series of evening classes to these caretakers, which might focus on issues of concern to them and include a discussion of sound health practices.

It might be concluded, then, that the policy suggestions articulated above could be implemented at minimum cost to the public. Insofar as these suggestions depend largely on voluntary participation, their implementation may be slow. It will clearly take considerable time for local planning groups to organize themselves and to establish constructive working relationships with licensed day care centers and family homes. However, children in out-of-home care are among the most vulnerable in our society to the spread of infectious diseases, and the policies suggested here will begin to respond to that vulnerability.

Family Nutrition and Women in the Labor Force

Overview of Studies on Nutrition and Female Employment

The entry of increasing numbers of women with children into the labor force has introduced changes in family roles which are tantamount to a benefit-cost problem for the working mother, who must act not only as her child or children's caretaker but also as a contributor to family income. Under such circumstances, the working mother must consider whether the nutritional benefits of her contribution to household income outweigh the nutritional costs of her having less time for menu-planning, shopping, and food preparation, plus the cost of possible loss of eligibility for federal nutrition programs.

There are many ways that a mother's entering the labor force can both positively and negatively affect family nutrition. The first way affects primarily infants who might otherwise be exclusively or predominantly breast-fed. For the infant whose mother goes back to work, the decrease in mother's child-care time inevitably means a decrease in breast-feeding. Whereas there is no conclusive evidence that bottle-feeding affects long-term nutritional status, there is some evidence that infants who are bottle-fed have more febrile days and/or illness days than breast-fed infants, possibly due to immaturity of the infant's immunological system combined with the absence from formula of immune substances found in breast milk (Winick, 1981). The medical care required by a sick infant, and the income lost by the working parent who must stay home to care for the infant, are real costs which must be borne by the family with a working mother. Whether the costs for families with working mothers are significantly greater than those for families with mothers who choose to remain at home is unknown.

Another mechanism through which a woman's entering the labor force can affect her family's nutrition is through the effect that the preschool child's having meals outside the home may have on his or her nutritional status. For children eligible for federally subsidized nutrition programs such as the Child Care Food Program (CCFP), diets may actually improve. However, a mother's increased income may make her child ineligible. The day care center, receiving less CCFP funds, must either charge the ineligible families more or pass the cost on to all parents in the form of increased tuition fees. Not only has income eligibility for CCFP been restricted, but changing federal policy has reduced the number of servings available to eligible children from three meals and two snacks per day to two meals and one snack per day. These changes could further compromise the ability of centers to afford adequate meals, especially for those children whose parents work long hours or overlapping shifts.

Similar dynamics affect the school-age child whose parent or parents work. Such a child may take two meals (breakfast and lunch) outside the home. Just as in the case above, increased family income may mean loss of eligibility for free or reduced-price breakfasts or lunches. Paradoxically, the mother who has entered the labor force, and who may therefore have less time to plan and prepare meals for school-age children, may now find her family ineligible for federally subsidized school breakfasts and school lunches. Simultaneously, federal support for these programs has declined,

through both less generous income criteria and decreased federal subsidies per meal.

The fact that children in school or in full-time day care get as many as two of their three meals a day away from home underscores the critical importance for children's nutritional status of what is served in schools and centers. The loss of federal funds means either increased costs or decreased quality of meals. It could also mean loss of the food program entirely. So far, about 3 million children and 2,700 schools have dropped out of the School Lunch Program, and 470,000 children and 650 schools have dropped out of the School Breakfast Program (Food Research Action Center, 1983). Despite mythology to the contrary, bag lunches from home have been shown to provide a much poorer diet for the younger child than school meals prepared according to federal guidelines (Golden, undated). Finally, the reduced time a working mother has to successfully complete the application process may explain why in many cases children of working mothers are less likely to participate in school feeding programs than children whose mothers are not in the labor force. These same constraints may further compromise a mother's ability to negotiate the often complicated bureaucracy standing between her and her family's eligibility for other federal nutrition services such as WIC or food stamps.

A final pathway through which a woman's entering the labor force could affect her family's nutrition is through the impact of working on the time available for food production. When time goes down and income goes up, mothers are likely to have less time to plan nutritionally balanced meals, less time to shop, and less time to prepare meals. The result is usually more processed food, including frozen dinners and meals in fast food restaurants. Although the net effect of these changes on nutrient intake is unclear, there is little doubt that nutrient density per unit cost is less. In the context of the household, the higher income may result in no real nutritional benefits, but merely a substitution of the working woman's market wage for the care and effort formerly devoted to shopping and home production.

In a society where people's worth and self-esteem are measured in large part by their work and the compensation they receive for work, it is no longer sufficient for many women to eschew gainful employment in favor of being a full-time mother and homemaker. Society presents conflicting values to the mother via a work ethic on the one hand and the traditional message to stay home with her children on the other. Without real economic benefits for the mother who chooses to stay at home, that latter option is becoming less and less viable.

There really are, therefore, only three alternatives. One is to do nothing, and assume that women will make the right benefit-cost decision for themselves. This basically cynical option places a higher value on so-called free choice than it does on people's health. In fact, if any of the adverse health consequences for children of mothers choosing to work outside the home come to pass, the free choice of subsequent generations may be compromised by their poorer health status.

The remaining two alternatives both respond to the needs of families of women who at present must choose out of economic necessity to go to work. Society could underwrite services for the children of mothers who work, or

could in effect subsidize mothers who choose to stay home, or both. The former services must include guarantees of nutritious meals for children in care or in school. Eligibility should be on a sliding scale, and child care institutions and schools need the assurance of continued federal support for equipment and training in addition to the subsidies to cover part of the cost of food. Eligibility criteria may be relaxed rather than contracted so that the child of the newly working mother can continue to receive subsidized meals.

A family should not have to choose between working and being eligible for school meals and food stamps. School and child care meal programs should be viewed, not as a welfare program, but as a mechanism for supporting families with children, whether their mothers work or not. If, in fact, we as a society wish to encourage women to work, then the working women should have more resources available for food, not less. This implies that food stamps too should be allocated on a sliding scale, not on the basis of a dollar for dollar loss of benefits with increasing income. Being able to keep a portion of the food stamp benefit would not discourage women from seeking the employment they may desire. Local demonstration projects testing the effects of such a sliding eligibility scale for food stamps, or the effects of taxing some portion of the food stamp bonus for women who get a job, would add to our understanding of the policy implication of these alternatives.

On the other hand, society could decide deliberately to make it more attractive for the woman to stay at home by offering real financial incentives in addition to food stamp and supplemental food benefits. In a number of industrialized countries, such as Norway, Finland, Denmark, Czechoslovakia, Hungary, Poland, France, Austria, West Germany, Great Britain, and Canada, a child or family allowance, often in addition to tax rebates or tax deductions, are provided to families with children (Kamerman & Kahn, 1978). To be progressive, such benefits would either have to be scaled according to need or, if available to all families with children regardless of income, would have to be considered taxable. In any case, the financial incentive to leave the home to go to work would be reduced.

Policy Recommendations

We would argue that it is in the best interests of the nation and most consistent with American ideas about freedom to make it possible for women to choose to work without risking their family's health or to stay in the home without sacrificing the nutritional benefits of higher income. In other words, both nutritional supports for the children of working women and additional resources for women who choose to do the work of raising their own children should be available, but they should be alternatives. Different sets

of nutritional benefits for children should result in equitable benefits for all children regardless of whether their mother works. The benefits should be structured such that the mother who goes to work does not receive added nutritional programs, nor would she lose the net value of those benefits she received for her children when she worked in the home. The only difference would be the nature of the nutritional support, whether available at home or out of the home, not the amount. In both cases vertical equity would be achieved through progressive taxation of benefits.

Health Insurance for Mothers

It is well known that having health insurance coverage substantially fosters access to health care. However, a major barrier to labor force participation for some females is the lack of adequate health insurance benefits that would mitigate the high cost of medical care and provide access to medical services. This is especially true for single female heads of households who depend on AFDC for medical insurance. If a single female head of household works and her income exceeds the limits established for AFDC eligibility, then she loses both her AFDC benefits and her health benefits--and sometimes benefits such as housing and food stamps as well. This so-called "notching" effect often provides a disincentive for labor force participation since in many states Medicaid is more comprehensive than private health insurance, and women frequently obtain jobs where no insurance is provided. Thus, it might become more expensive for a single head of household to work since she may lose more than she gains. However, it is interesting to note that in a recent study when AFDC recipients were asked whether they would give up their benefits and start working if they could keep their Medicaid and food stamp benefits, most said they would do so (Belle, 1982).

Table 1 presents national data on health insurance coverage of single mothers who are heads of households and married mothers according to whether they are employed, unemployed, or out of the labor force. Unemployment is defined as: 1) not working; 2) looking for but unable to find work; 3) waiting to be called back to a job from which one has been laid off; or 4) waiting to report to a new wage or salary job within 30 days. Mothers not in the labor force (NILF) are those not looking for work either because they are discouraged, cannot afford to leave children alone, have outside sources of income from relatives or a spouse, or for some other reason.

The data presented in Table 1 (as well as the other tables below) are taken from the March, 1981 Income Supplement of the Current Population Survey (CPS). The CPS, collected by the Bureau of the Census, is conducted monthly on a sample of approximately 60,000 households chosen to provide reliable estimates of the nation as a whole.

Table 1 indicates that the bulk of employed mothers--single and married--and unemployed and NILF married mothers are covered by some sort of group health insurance (e.g., private plans such as Blue Cross/Blue Shield or commercial insurance). However, whereas 86.2% of married mothers who are employed have group insurance, only about 67% and 77% of single, employed mothers and unemployed, married mothers respectively have health insurance coverage. The disparity in coverage for these two groups of mothers is

Table 1

U. S. Data on Health Insurance Coverage for Mothers

by Marital and Employment Status

Type of Health Insurance	Marital and Employment Status					
	Employed Mothers	Employed Single Mothers	Unemployed Married Mothers	Unemployed Single Mothers	NILF Married Mothers	NILF Single Mothers
Group Health Insurance	86.20	66.72	76.83	26.15	71.60	4.69
Medicare	0.08	0.29	0.14	1.48	0.83	3.67
Medicaid	1.96	14.47	8.47	53.30	6.69	71.30
Military or Champus	8.06	1.67	9.94	6.36	11.62	2.74

Note: All data are percentages; columns may add to over 100% since individuals may have more than one type of health insurance coverage.

presumably caused by the health insurance coverage available to married mothers through their spouses' employer. Thus, that unemployed, married mothers and NILF, married mothers are covered by group health insurance to such a large extent is not surprising. By way of contrast, single mothers who are unemployed or NILF have relatively little group health insurance coverage. The gap between these mothers and married mothers is filled to some degree by Medicaid, but a rather large gap still exists. Moreover, as pointed out earlier, some of these mothers might lose their Medicaid coverage due to employment.

These national data have important policy implications. As women become employed and the economy improves, more women will be covered by health insurance. However, in the short run, as Medicaid budget cuts loom larger, these groups of women and their children will have neither health insurance coverage nor the means to buy it.

Table 2 presents data similar to that in Table 1 except that the percentages are for the South Atlantic region (which includes North Carolina). The data are very similar for the South Atlantic region and the nation as a whole. Nevertheless, there are a few notable differences. A slightly higher percentage (and one that is statistically significant) of unemployed single mothers in the South Atlantic region have group health insurance coverage. However, Medicaid picks up a substantially smaller proportion of NILF single mothers than in the nation as a whole--about 58% of NILF, single mothers have health insurance coverage through Medicaid in the South Atlantic region whereas for the U.S. as a whole the figure is about 71%.

Tables 3 and 4 put the data presented in Tables 1 and 2 into perspective. These tables summarize data on the percentage of mothers who have no health insurance at all, as well as the percentage who have single or multiple coverage. A very large percentage of all mothers have no health insurance coverage at all. In 5 of the 6 categories (all except employed single mothers), a greater proportion of mothers are uncovered in the South Atlantic region than in the U.S. as a whole. Thus, for example, over 30% of unemployed or NILF single mothers had no health insurance in the South Atlantic region; for every other group--except employed married mothers--20% or more had no health insurance coverage. As might be expected, employed, married mothers are the best off with only about 12% lacking health insurance coverage. Tables 3 and 4 also indicate that very few mothers have more than one type of health insurance.

Several policy options may be offered:

1. "Smooth out" the notch in Medicaid coverage so that coverage is gradually withdrawn as income increases. This may be done, for example, by introducing coinsurance deductible or small premiums (e.g., let individuals partially buy Medicaid coverage).

2. Allow individuals who choose to work for employers who offer little or minimal coverage the opportunity to purchase either Medicaid coverage or private health insurance. Private health insurance could be provided through a risk pool and subsidized by an employer.

3. Initiate a mandatory national or state health program.

Table 2

South Atlantic Data on Health Insurance Coverage for Mothers

by Marital and Employment Status

Type of Health Insurance	Marital and Employment Status					
	Employed Mothers	Employed Single Mothers	Unemployed Married Mothers	Unemployed Single Mothers	NILF Married Mothers	NILF Single Mothers
Group Health Insurance	83.32	69.29	6.89	24.27	65.65	4.61
Medicare	0.03	0.21	0.68	4.60	0.00	3.65
Medicaid	1.06	11.22	10.13	51.88	4.99	58.46
Military or Champus	8.06	1.67	9.94	6.36	11.62	2.74

Note: All data are percentages; columns may add to over 100% since individuals may have more than one type of health insurance coverage.

Table 3

U.S. Data on Percentage of Mothers with Different Numbers of Health Insurance Coverage by Marital and Employment Status

Number of Health Plans	Marital and Employment Status					
	Employed Mothers	Employed Single Mothers	Unempl Married Mothers	Unempl Single Mothers	NILF Married Mothers	NILF Single Mothers
None	10.80	22.75	15.27	26.80	19.88	23.63
1	85.38	72.00	71.74	79.09	75.95	71.74
2	3.78	5.12	5.48	8.17	4.34	4.64
3	0.04	0.13	0.15	0.65	0.13	0.00

Table 4

South Atlantic Data on Percentage of Mothers with Different Numbers of Health Insurance Coverage by Marital and Employment Status

Number of Health Plans	Marital and Employment Status					
	Employed Mothers	Employed Single Mothers	Unempl Married Mothers	Unempl Single Mothers	NILF Married Mothers	NILF Single Mothers
None	11.78	21.95	19.46	30.69	21.61	32.71
1	83.98	74.72	72.42	55.05	73.84	64.71
2	4.24	3.33	8.12	12.00	4.55	3.12
3	0.00	0.00	0.00	2.26	0.00	0.00

4. Reorganize the current system for providing health insurance by severing the link between employment and health insurance. Individuals could then buy into group health insurance plans regardless of employment status. Employers (in the case of the employed) and the State of North Carolina (in the case of the unemployed) could contribute a sum (equal to what they themselves would have paid) towards purchase of such insurance.

These recommendations essentially illustrate two different approaches to providing better health insurance for mothers, and particularly mothers who are unemployed or NILF: 1) mandatory insurance regardless of health insurance status (recommendations #3 and 4), and 2) filling in the gaps between current types of coverage. State passage of mandatory insurance, while socially desirable, is probably too expensive now. Thus, the approach of filling gaps in present coverage is probably more feasible because it is less costly. But this appraoch does not address the fundamental fact that some mothers, despite the availability of health insurance, may not have enough money to pay premiums.

Occupational Health and the Female Labor Force

Overview of Information on Occupational Health

The work-related health issues that have developed consequent to changes in the employment of women can be addressed at the individual, family, and societal levels. Women employees predominate in traditionally female jobs such as food services, clerical, health care, textiles, hair dressing, and dry cleaning. These are often low-paying, nonunionized occupations where potential work hazards are overlooked. For example, 75% of the health care services workforce is female. These women are exposed to various biohazards (e.g., hepatitis and other infectious diseases), chemical, and mechanical/physical agents that contribute to a significant rate of illness and disability.

In addition to these hazards, the working woman is frequently subjected to the stress of a dual work role: full-time employee and full-time homemaker/parent. The Framingham study's recent data suggest that women workers are a population group at high risk. For example, married female clerical workers with children were three times as likely as married women without children to develop coronary heart disease. Coronary heart disease was five times as prevalent in married female clerical workers with children as in single clerical female workers without children. Using Metropolitan Life Insurance data, Estelle Ramey (1980) concludes that the association between marriage, parenthood, and working holds for blue collar working women but not for white collar or professional women. Therefore, the stress perceived by blue collar working women seems to be caused not by entering the workforce per se but by their dual role expectation and the lack of autonomy, control, and recognition that is experienced by people in low status jobs.

Women who have moved into traditionally male dominated jobs face additional work hazards. They are exposed to a variety of substances for which safe exposure levels have been established on the basis of research

conducted among only men. Personal protective equipment, designed for the average male worker, may not adequately protect the female. Further, expectations for manual tasks associated with a job, such as load lifts, have been designed for the male physique, physiology, and endurance.

The nature of work is changing in all occupations. Forty percent of the work performed by individuals today will be replaced by automation during the next fifteen years. By the year 2029, eighty to ninety percent of the entire workforce will be employed in jobs involving information processing (Gregory & Nussbaum, 1982). Clerical work and low level data processing jobs will grow more rapidly than any other job category. Most of these new jobs will be held by women. A wide range of health problems have been associated with the use of video display terminals (VDTs) or cathode ray tubes (CRTs) employed in information processing.

These problems are associated with the ergonomics or design of the VDTs and the manner in which they are used. VDT workers complain of eyestrain, loss of visual acuity, change in color perception, back and neck pain, abdominal pain and nausea. Headaches, fatigue and tension are common responses to the physical stress and work pacing imposed by VDT work (Grandjean, 1979). A recent survey of VDT workers found "higher levels of job stress than have even been observed on assembly lines" (Smith, Cohen, Stammerjohn & Happ, 1981). The relationships between worker health and this change in the nature of work have just recently become concerns of scientific study. At this time, there has been only the one study of VDT workers which was conducted by the National Institute of Occupational Safety and Health (NIOSH, 1980).

Overlapping the individual and family levels is the issue of reproductive effects of work-related substances. These effects may be impaired reproductive capability, mutagenesis, teratogenesis, and transplacental carcinogenesis. More than 63,000 chemicals are used in the workplace. Reproductive effects have not been well-researched for all these known substances, let alone the more than 3,000 new chemicals that are introduced each year. Although reproductive effects often are addressed in the testing of new substances, the potential hazard produced by combining substances in work processes is largely unknown. One corporate response has been to exclude all female workers from work sites with identified reproductive hazards. This action has raised legal, ethical, and societal issues.

The two-income family also doubles the possibility of family members' potential exposure to occupational hazards, such as beryllium, asbestos, lead, and chlorinated hydrocarbons (Bellin, 1981). Infants, because of their immaturity, are especially vulnerable to such contaminants. Nonetheless, work contaminants brought into the home have received little study.

This interaction of work and health also poses several policy issues at the societal level. What is society's responsibility for protecting reproductive capability and fetal health from work place exposures? Should occupational health and safety standards be set at levels to protect the fetus or should workers with reproductive ability be excluded from jobs with reproductive hazards? Would the latter policy constitute a violation of the country's discrimination laws? Can society afford to protect the most

susceptible individuals at work places? What societal interventions should be developed for the at-risk group of blue collar women workers and their families?

The U.S. Court of Appeals for the Fourth Circuit recently ruled against a North Carolina firm's exclusionary policy for women workers (Wright v. Olin Corporation, No. 81-1229). This decision reversed an earlier (December, 1980) district court ruling in favor of Olin's policy. The reversal was based on legal principle, under the Civil Rights Act and Equal Employment Opportunity Commission regulations, that exclusionary policies must be justified as a "business necessity." The Appeals Court reaffirmed that the "burden of persuasion is upon the employer to prove that significant risks of harm to the unborn children of women workers from their exposure during pregnancy to toxic hazards in the work place demand restrictions that apply only to women" (OCAW, 1983). This decision has implications for multiple industries in North Carolina.

The major industries that have potential reproductive hazards are health care, agriculture, microelectronics, dry-cleaning, textiles, and chemical synthesizers (Mesite & Bond, 1980), all of which are expected to increase in number in North Carolina. Thus, two major issues confront North Carolina policymakers:

1. What is the most effective and acceptable policy regarding the employment and placement of women in their reproductive years?

2. What measures can be considered to protect the fetus and child from work place exposures introduced by either parent?

Policy in this area is governed by federal and state legislation such as the Occupational Safety and Health Act and the Civil Rights Act and its 1972 and 1979 amendments. These laws specify that all employees are to be ensured a safe and healthy work place and that all individuals are entitled to receive equal treatment in hiring, job placement, and employment benefits. The Pregnancy Discrimination Act, a 1979 amendment to the Civil Rights Act, protects the female worker from being fired, or from being refused a job or a promotion because she is pregnant or has had an abortion. Pregnancy, and its related conditions, is to be treated as a temporary disability for which female workers are to receive the same benefits as workers with other disabilities. This act changed earlier policies of denying employment to or firing pregnant women. More than two-thirds of all pregnant women now work during at least a part of the gestational period. More than 89% of all women are employed outside the home for some period of their life (Hunt, 1977). Since so little is known about the dose-response relationship of many work place exposures, including the importance of time and duration, there may be a larger number of women and families at risk than is usually assumed.

There has been no uniform corporate response to this issue. Individual companies have instituted policies that mandate proof of sterilization for women of reproductive age who desire employment in areas with reproductive hazards. When these jobs are associated with incentives such as higher pay and increased job status, some women have complied with this policy (Bayer, 1982). This is especially true in areas where alternative employment is not

readily available. Other business organizations have simply banned female workers from certain jobs. Both approaches have drawn legal suits. Industry has preferred this type of legal suit to tort liability for subsequent adverse pregnancy outcomes.

Another example of industry's and society's response to occupational health issues is the action regarding lead hazards. Under the Occupational Safety and Health Act, the recent lead standard was based on the assumption that it is not always feasible to make the work place reproductively safe. The regulations mandate medical removal protection for those workers, of both sexes, who are planning to, or already have, conceived for a period of up to 18 months. Such workers must be guaranteed wage and seniority protection. This lead standard, however, is being contested by industry on the grounds of feasibility.

Although both industry and workers have lodged complaints with regulatory agencies, neither the Department of Labor nor the EEOC have developed an overall policy. In the absence of federal statutes, the protection of workers and business rests with the states.

These issues have, however, been dealt with at the national level in other countries. In 1981, Canada amended their Human Rights Act and their Labor Code to protect the reproductive rights of all workers, male and female. Exclusionary policies are prohibited by law; the Canadian government is reviewing occupational health standards to establish a single standard for each hazard that protects the most susceptible workers (Women's Occupational Health Resource Center, 1980).

Legislation enacted in the United States over the past two decades has affirmed our society's belief that Americans should not have to trade off their health for employment. This protection must be extended to workers' reproductive ability and to future, unborn children. As documented by recent events, work place hazards do not differentiate by gender or age. Dibromochloropropane (DBCP), diethylstilbesterol (DES), and lead, for example, are capable of inducing reproductive effects in all workers. To propose a policy that excludes only women from certain exposures denies this fact, discriminates against women's right to fair employment, and discriminates against men's right to equal health protection.

There is evidence that, in addition to chemicals, physical agents such as noise and vibration may be related to reproductive defects (NIOSH, 1980). With so many gaps in our scientific knowledge, policies to protect adult and child health must include all potential reproductive hazards. For similar reasons, policy should be proactive and should also encourage research.

Policy Recommendations

1. The state of North Carolina should develop a standardized occupational history form to facilitate job placement data collection. This form should be brief and should be used by industry, health care providers, and state registries of vital statistics.

2. Parental occupational health history forms should be recorded on all birth certificates, stillbirth certificates, and death certificates of children.

3. These data should be used as a basis for accelerated, continuous research supported by the state and industry.

4. Policy implications from the 20-year longitudinal study on work and pregnancy outcomes (the Collaborative Perinatal Project) should be addressed by occupational health standards. Of significant importance is that of all work hazards studied, the most adverse pregnancy outcomes were associated with pesticide exposure of the parents. Other exposures with reproductive effects suggested by this study include several chemicals, heat, heavy lifting, and ionizing radiation.

5. Responsibility for protecting workers and their children must be shared. To share this responsibility, workers must be informed of what they are exposed to, the associated health risks of such exposure, and the role of the worker and the industry in protecting the worker's health. Right to know legislation should be incorporated into state law and be extended to all workers.

6. The state should ensure that information about work hazards and reproductive effects is disseminated to the first line health care providers of workers and their families. This issue and identification of the high risk target populations of workers should be presented via a continuing education effort to health care providers across the state.

7. Small businesses (less than 500 employees), the majority of American and North Carolinean businesses, are associated with less healthy and less safe work sites and fewer resources to address those problems (Zenz, 1975). The state could most effectively assist these businesses and protect workers by increasing consultation services to industry through the Occupational Health Branch and the Occupational Safety and Health Administration. Consultation opportunities should be actively sought out rather than provided only upon request.

8. State policymakers and regulators should support the Canadian approach to standard promulgation and enforcement. Standards should be established to protect the most susceptible.

These recommendations propose steps that are proactive, maximally protective within the constraints of an inadequate scientific knowledge base, and most likely to decrease unnecessary exposure and associated reproductive effects.

Analysis of Occupational Health Issues: The Protection of Women Against Occupational Assaults on the Reproductive System

Problem Statement

The review above has shown how selected maternal and child health issues affect and are affected by female labor force participation. Of the various

issues discussed, one deserves additional analysis and discussion since it raises very challenging and fundamental issues related specifically to women's participation in the labor force. The issue to be addressed here is the protection of women against occupational assaults on her health, her reproductive system, or her fetus. This is an issue of great importance, for what are at stake are the gains in employment that women have won as a result of civil rights legislation and court actions. These gains are now being reversed under the guise of fetal health or the protection of female reproductive capability. That is, corporate responses to this issue of reproductive or fetal health have been to institute "protective discrimination policies" such as the demotion, transfer, and exclusion of women of child-bearing age from certain jobs that might compromise their capacity to bear children. Faced with the loss of a job or demotion to a position with less pay, some women have opted to have themselves sterilized. Policies such as these have led to a clash between those who have an interest in the rights of women workers and corporate policy to selectively protect the unborn child.

The importance of this issue is highlighted by the fact that the majority of women in the work force are of child bearing age--between 16 and 50 (U.S. Bureau of the Census, 1981, Table No. 637, p. 381). Furthermore, female-dominated occupations tend to be minimally regulated by the Occupational Safety and Health Administration, which concentrates its efforts on major industries and large work places. Thus, women tend to be less well-protected than men from hazards in the work place.

The concern for the special vulnerability of the female reproductive system to occupational hazards is derived from research indicating that many occupations, especially those where females make up a vast majority of the labor force, are hazardous to fetal health because they expose workers to industrial substances with fetotoxic potential; e.g., benzene, lead, vinyl chloride, carbon tetrachloride, and carbon monoxide. Some of the jobs that have been implicated as having fetotoxic potential are shown in Tables 5 and 6. Of note is the fact that a large proportion of North Carolina's female workers are found in textiles and hospital/health related occupations where exposure to these chemicals is likely.

Much of the empirical evidence showing the deleterious effects of fetotoxins is derived from animals studies (Wolkowski-Tyl, 1981). In only a few cases does valid information exist on the effects of industrial substances on women workers and the female reproductive cells. Additionally, little is known about whether males are just as sensitive to some of the toxic agents and whether these agents affect males' capacity to produce offspring. As noted by the Council on Environmental Quality after reviewing the limited scientific evidence on reproductive outcome and toxic substances:

> It does not necessarily follow that women are more sensitive to actions of any given agent. In fact, when extensive data were available, as in the case of smelter emissions and anesthetic gases, they indicated adverse effects on both women and men; they also show evidence of harm to the fetus following the exposure to toxic substances.

Clearly, the issue of women's, reproductive and fetal health has implications for female (and perhaps male) labor force participation. Therefore, our primary goal in this section is to select a policy that

Table 5

Examples of Occupational Exposures in Predominantly Female Jobs

Occupation	Exposures
1. Textile and Related Operatives	
a. Textile operatives	raw cotton dust, noise, synthetic fiber dusts, formaldehyde, heat, dyes, flame retardants, asbestos
b. Sewers and stitchers	cotton and synthetic fiber dusts, noise, formaldehyde, organic solvents, flame retardants, asbestos
c. Upholsterers	same as above
(Some specific chemical encountered in tne above occupations are: benzene, toluene, trichloroethylene, perchloroethylene, chloroprene, styrene, carbon disulfide)	
2. Hospital/Health Personnel	
a. Registered nurses, aides, orderlies	anesthetic gases, ethylene oxide, x-ray radiation, alcohol, infectious diseases, puncture wounds
b. Dental hygienists	x-ray radiation, mercury, ultrasonic noise, anesthetic gases
c. Laboratory workers	wide variety of toxic chemicals, including carcinogens, mutagens and teratogens, x-ray radiation
3. Electronic Assemblers	lead, tin antimony, trichloroethylene, methylene chloride, epoxy resins, methylethyl ketone
4. Hairdressers and Cosmetologists	hair spray resins (plyvinyl pyrolidone), aerosol propellants (freons), halogenated hydrocarbons, hair dyes, solvents of nail polish, benzyl alcohol, ethyl alcohol acetone
5. Cleaning Personnel	
a. Launderers	soaps, detergents, enzymes, heat, humidity, industrially contaminated clothing, perchloroethylene, trichloroethylene, stodard solvent (naphtha), benzene, industrially contaminated clothing

Table 5 (Continued)

Examples of Occupational Exposures in Predominantly Female Jobs

Occupation	Exposures
6. Photographic Processors	caustics, iron salts, mercuric chloride, bromides, iodides, pyrogallic acid, silver nitrate
7. Plastic Fabricators	acrylonitrile, phenol-formaldehydes, urea-formaldehydes, hexamethylene-tetramine, acids, alkalies, peroxide, vinyl chloride, polystyrene, vinylidene chloride
8. Domestics	solvents, hydrocarbons, soaps, detergents, bleaches, alkalies
9. Transportation Operatives	carbon monoxide, polynuclear aromatics, lead and other combustion products of gasoline, vibration, physical stresses
10. Sign Painters and Letterers	lead oxide, lead chromate pigments, epichlorohydrin, titanium dioxide, trace metals, xylene, toluene
11. Clerical Personnel	physical stresses, poor illumination, trichloroethylene, carbon tetrachloride and various other cleaners, asbestos in air conditioning
12. Opticians and Lens Grinders	coal tar pitch volatiles, iron oxide, dust solvents, hydrocarbons
13. Printing Operatives	ink mists, 2-mitropropane, methanol, carbon tetrachloride, methylene chloride, lead, noise, hydrocarbon solvents, trichloroethylene, toluene, benzene, trace metals

Source: American College of Obstetricians and Gynecologists, 1977, pp. 64-66.

Table 6

Decision Matrix for Female Occupational Health Safety

Analysis Criteria	Policy Alternatives			
	Do Nothing	Restrict Female Employment	Improve Working Conditions for Females	Improve Working Conditions for All Workers
General				
Horizontal Equity	-	-	+	+
Vertical Equity	-	-	+	+
Stigma	±	-	±	+
Preference satisfaction	-	-	+	+
Unintended consequences	±	-	-	+
Efficiency	-	+	-	+
Privacy	±	-	+	+
Specific				
Health of Woman	-	+	+	+
Health of Fetus	-	+	+	+
Health of Families	-	±	±	+

Note. + = satisfies criterion; - = fails to satisfy criterion; ± = equivocal or no effect.

effectively addresses this problem. To identify the best policy, we will follow the approach to policy analysis recommended by Haskins and Gallagher (1981). In brief, we will identify and define several criteria and use these to rate the effectiveness of several policy options that have been proposed as means of increasing occupational safety for women.

Analysis Criteria

Analysis criteria may be general if they are relevant in any policy analysis or specific to the problem under discussion. The general criteria used to evaluate reproductive and fetal health policy alternatives are: equity, efficiency, right to privacy, avoidance of stigma, preference satisfaction, and unintended consequences. Two types of equity are considered in this analysis: vertical and horizontal equity. Vertical equity is the unequal treatment of unequals so as to make them more equal. Vertical equity suggests that a good policy is one that redistributes resources from the "haves" to the "have nots." Horizontal equity seeks to treat equals as equals. Thus, for example, women workers in the various states--and the counties within a given state--should have equal protection from occupational hazards. Efficiency is defined as the use of resources so that they produce the maximum benefit for the smallest expenditure. Preference satisfaction requires that a policy produces the most happiness for the greatest number of people, usually by creating options and allowing individuals to maximize their own preferences. The right to privacy stipulates that a policy not permit an intrusion into the life of the individual. Avoidance of stigma means that individuals will not be labeled as different in a negative way from other citizens not affected by the policy. Unintended consequences are the unanticipated negative side effects of a policy.

There are in addition to the general criteria three specific criteria in the area of women's occupational health. These are the health effects on women workers themselves, health effects on the fetus, and the health effects on workers' families. These criteria are self-explanatory, provided that we understand that workers' families could include the families of male workers and the reproductive experience of their wives.

Policy Alternatives

We examine five alternative policies for addres g the problem of occupational health of working women. These are:

1) Do nothing.

2) Leave current policies intact while supporting a research program to document the health consequences of specific occupational risks to women's health.

3) Restrict women for whom pregnancy is not ruled out from occupations or work areas known or suspected to be reproductive health risks.

4) Improve working conditions for all women.

5) Improve working conditions for all workers.

The first alternative would in fact represent a retreat from congressional and regulatory mandates (e.g., the Occupational Safety and Health Act). The second implies an important commitment on the part of the state to spearhead a collaborative effort among government, industry, and universities to find out more about occupational health hazards to women, including reproductive health hazards. If such an effort implies delaying necessary protections, it would not be acceptable. On the other hand, additional research can and perhaps should be an adjunct to any of the next three policies.

The third policy is one which would deliberately protect the fetus and the pregnant women at the expense of the woman's job preferences and advancement opportunities. This approach, which is followed to some extent in some European countries such as France and Austria (Kamerman & Kahn, 1978), seems to be the preferred response of many American industries. It does not satisfy female workers who may have to choose between an attractive job opportunity and future fertility.

The fourth alternative would focus on making improvements in the work place wherever women may be employed. This approach would presumably benefit both the woman and her fetus and would, if successful, eliminate the problem of having to restrict women from certain jobs. However, such a policy may be seen as favoring women over their male co-workers and might arouse some opposition. In fact, if all jobs were available to women, and if the health hazards of those jobs were limited, men would also benefit, but not necessarily to the same extent as they might under a more even-handed approach. Industry, too, might resist this approach if it involved major changes in work sites at significant expense. Industry might also be leery of reverse discrimination suits on behalf of male workers.

The final alternative is that adopted in Canada, namely, to protect the health and reproductive rights of all workers regardless of sex. This approach would avoid charges of reverse discrimination. If pursued sincerely, both male and female workers should benefit. Again, significant changes in current practices in many industries may be resisted by employers and by a government less inclined to regulate the private sector. Since the benefits of such a policy would extend beyond the limits of any one industry, the use of public resources to aid industry in making the necessary conversions may be justified. Indeed, the use of public funds has often been proposed for the retooling of major industries to more efficiently meet overseas competition. A similar argument might be advanced to support retooling for health.

Analysis of Policy Alternatives

Table 6 is a decision matrix that contains our ratings of all the alternative policies except research. (We will return to the research alternative policy below.) Our intent here is simply to briefly summarize the arguments that might be made against and in support of the alternative policies.

Do nothing. The do-nothing alternative is listed simply to indicate a baseline against which other policies may be judged. The ratings in Table 6 show that, on the basis of the criteria we have selected, the do nothing policy

is clearly unacceptable. Because this policy would require repeal of existing legislation and practices, and especially the Occupational Safety and Health Act, it would intensify existing health hazards. Therefore, this option need not be discussed any further.

Restrict female employment. The alternative of restricting female employment fails to satisfy all but one of the criteria. Restricting women from potentially hazardous work sites violates principles of equity by eliminating women from occupational categories. Women at similar skill and experience levels as men are therefore not treated equally, violating the horizontal equity criterion. At the same time, women, who are already less well paid than men in similar work roles, would have even fewer opportunities to advance and reduce existing inequalities, violating vertical equity.

This policy would also restrict the preference satisfaction of females by barring them from potentially attractive jobs. Such a policy also requires some women to violate their privacy because they can assume hazardous jobs only if they announce their intention never to have a child. On the other hand, this policy could be efficient, protecting the reproductive health and the health of the fetus at no expense to the employer, if the assumption that the identified hazard effects women more than men is correct. However, there have been some challenges to this assumption. If, in fact, men who are placed in unsafe work sites in lieu of women themselves have adverse reproductive health consequences, then this policy would violate the criterion of unintended consequences.

The policy of restricting fertile women from hazardous areas does protect their health and that of the fetus. It may also inadvertently protect other family members if the danger is a substance which could be carried into the house on clothing. However, this advantage is more apparent than real because women would simply be replaced by men in these hazardous positions with the result that men's families would be at risk.

Improve working conditions for females. This policy would not restrict where women worked but would direct resources specifically at reducing women's health risks and reproductive risks. Such an approach would increase vertical and horizontal equity between men and women and among women, some of whom have not been admitted to certain work sites because they weren't prepared to give up childbearing. Minority women would also be less likely to work disproportionately in dangerous occupations. Women's occupational choices would improve, their privacy would be protected, and they would no longer be stigmatized. Paradoxically, one untoward effect of this policy would be to indirectly stigmatize men who might lose resources previously targeted for their protection. This might lead to inefficiency if the more efficient among male workers began to avoid hazardous jobs (or are injured on the job). Another untoward effect might be the increased competition from women that men might face for positions formerly available only to men.

Other improvements over the previous policy include respect for women's privacy and satisfying career preferences. Thus, most of the general criteria would be met by this policy alternative, but the families of male workers may be exposed to hazards if male workers do not share in future progress in occupational health.

Improve working conditions for all workers. Finally, the last alternative considers the health of all workers, both male and female. By reducing risks for all, the policy can reduce inequity between men and women and between minority and non-minority women. Stigma is eliminated, privacy maintained, and preferences are honored. There are unlikely to be untoward effects, and the strategy meets all of the health-specific criteria unequivocally, including the criterion of health of families of men as well as women.

It may be argued on strictly cost-benefit criteria that, if the problem is women's health, the most efficient solution would be to concentrate resources on reducing those risks which are specific to women. Industry has long argued that occupational health measures are too costly and counter- productive. The evidence, however, suggests otherwise. In two specific cases those industries which complied with more stringent occupation health regulations found their profits improved. The first example is that of polyvinyl chloride, which causes angiosarcoma in workers and increased fetal loss among the wives of exposed male workers. A recent report documents that industries which brought exposures down to the regulated levels made more money than those that didn't. In the second case, the 80% of the textile mills which complied with cotton dust standards did better financially than the 20% that did not (Occupational Health and Safety Letter, 1982).

This strategy of extending protection to all women meets nearly all the specific criteria unequivocally, with the possible exception of efficiency. The strategy also includes all the recommendations made in the occupational health section above. If a policy choice were to be made simply by adding the pluses and minuses, the fifth alternative would be selected. However, this choice assumes that all the criteria are given equal weight. In fact, one must consider whether society values the health of women as much as the health of the fetus, and especially whether short-term costs are more important than the other criteria.

Policy Choice

Based on this exercise, we favor adopting the policy that attempts to reduce occupational health hazards for all workers. However, on an industry-by-industry basis, there is little doubt that implementing the policy would be very expensive. This is the ideal solution; the implementation of this policy will require an increase in our knowledge of the effects of industrial substances on female and male reproductive health, an expansion of the technical capability to control occupational hazards, and an increase in the resources of programs to ensure occupational health. Nonetheless, we recommend that the various government agencies responsible for rulings and regulations regarding the protection of workers from occupational hazards move to protect all workers by banning or restricting the use of chemicals or substances that have been shown to present an unreasonable risk.

Finally, we would like to add a brief comment about occupational health research. The approach which would exclude women from certain jobs is short-sighted and, in addition to exposing men to reproductive and other health risks, can only be justified as a temporary expedient while proven health hazards to the fetus are being removed, and while seniority and pay levels for

displaced women are guaranteed (Bayer, 1982). Until such a time as health risks to men and women are equalized, both government and industry have the responsibility to contribute to a fund for the support of occupational health research, both basic and applied. Liability for deleterious effects on fetal and reproductive health can also be managed in the short run through a separate, collaborative fund involving all parties genuinely interested in improving health outcomes without discriminating against women or threatening the health of newborns. One workshop participant suggested that, while such contributions to research and liability funds should be mandatory, they may be more attractive to industry if they were tax deductible.

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